

Remarks

Claims 1-23 are pending in the application. Claims 1-3, 6-12, 15-18 and 20-23 are rejected, while claims 4, 5, 13, 14 and 19 are objected to. By this paper, claims 21 and 22 are amended. Based on the following, consideration of the amended claims, and reconsideration of the remaining claims, are requested.

Drawings

The Examiner objected to the drawings under 37 C.F.R. § 1.83(a). Specifically, the Examiner stated that the motor and the second controller must be shown, or canceled from the claims.

Applicants note that the motor is illustrated in Figures 1 and 2 as originally filed—i.e., in the embodiment shown in the drawing figures, the motor is the integrated starter generator (ISG) 14. As recited in paragraph 0015 of the specification, the vehicle shown in Figure 1 includes "a motor, or integrated starter generator (ISG) 14." As described in paragraphs 0015 and 0016 of the specification, the ISG 14 is capable of providing torque to the vehicle wheels 18—i.e., functioning as a motor—and is also capable of charging the battery 22 when it is run in a regenerative mode—i.e., when it is functioning as a generator. Although the claims are not limited to an integrated starter generator, the ISG 14 shown in Figures 1 and 2 is one type of motor that can be used in accordance with the invention recited in the claims.

With regard to the "second controller", paragraph 0017 makes it clear that the second controller is designated with the label 28, and this feature is also shown in Figures 1 and 2. Thus, both the motor and the second controller, recited in the claims, are illustrated in the original drawing figures. Therefore, no amended drawings have been submitted with this amendment.

To further clarify the distinction between the various controllers illustrated in the drawing figures and described in the specification and claims, paragraph 0018 of the specification has been amended. In particular, the specification now explicitly states that the field oriented torque controller 30 is "a motor controller". This designation is fully supported by the drawing figures and the specification as originally filed. For example, as explained in paragraph 0018 of the specification, and illustrated in Figure 2, the controller 30 receives commands directed to the motor (the ISG 14) and outputs voltages which are used to produce currents to control the motor. Field oriented torque controllers, such as the controller 30, are well known in the art as a type of motor controller. In the embodiment shown in Figure 2, the controller 30 is integrated into the first controller (the MCU 26). The claims are not limited to a motor controller as specifically embodied in the controller 30; however, the controller 30 does provide one example of a motor controller that can be used in accordance with the present invention.

In summary, the drawing figures as originally filed illustrate a motor (the ISG 14), a first controller (the MCU 26), a second controller (the controller 28), and a motor controller (the field oriented torque controller 30). In addition to being illustrated in the drawing figures as originally filed, each of these features is described in the original specification.

Specification

As discussed above, paragraph 0018 of the specification was amended to explicitly include the label "a motor controller". In addition, paragraph 0006 of the specification has been amended to delete the words "is provided". These words are redundant, and as such, have been deleted.

Claims

By this paper, claims 21 and 22 were amended to more particularly point out and distinctly claim the subject matter of the invention. In particular, each of these claims now recites "the first controller", rather than just "the controller". This change merely provides consistency with claim 18, which is the base claim for each of these dependent claims. No new matter has been added by this change.

Claim Rejections—35 U.S.C. § 102

The Examiner rejected claims 1-3, 6, 8-9, 10-11, 15-18 and 22-23 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,784,536 (Nada). The MPEP states that "'a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.'" MPEP § 2131, 8th ed., Rev. 2 (citation omitted). The MPEP further states that "'the identical invention must be shown in as complete detail as is contained in the... claim.'" *Id.* (citation omitted). Because each of these claims contains elements which are neither expressly nor inherently described in Nada, it is submitted that none of these claims is anticipated by that reference.

Claim 1 of the present application recites a method that includes "determining a first torque, the first torque being a function of at least the measured current... determining a second torque, the second torque being a function of at least the power output from the power source, the determined power loss, and the motor speed; and comparing the first torque to the second torque when the motor speed is above a predetermined speed." Nada describes a method of controlling a hybrid electric vehicle that includes determination of an upper limit torque (Tmmx). (Col. 28, ll.24-25.) The upper limit torque is calculated from a maximum consumed energy (Pmmx) and the revolving speed of the motor. (Col. 28, ll. 16-20.) The maximum energy consumed by the motor (Pmmx) is based on the maximum motor torque, the revolving speed of the motor, and certain motor losses. (Col. 27, ll. 22-38.) It is unclear from this discussion whether the method in Nada uses "the power output from the power source"

as specifically recited in claim 1 of the present application. Thus, it is submitted that the upper limit torque (T_{mmx}) of Nada is not the same as the second torque recited in claim 1 of the present application. Even if, however, the upper limit torque (T_{mmx}) of Nada is assumed to be the same as the second torque recited in claim 1, there are other elements within claim 1 that are neither expressly nor inherently described in Nada.

The upper limit torque (T_{mmx}) calculated in Nada is compared to a previously determined value of a required torque (T_{mr}). (Col. 28, ll. 23-25.) The required torque (T_{mr}) is calculated by subtracting a direct torque from a required torque (T_d) of the axle. (Col. 28, ll. 1-4.) The direct torque is based on "a specific portion of the torque T_e of the engine 150 transmitted to the axle...." (Col. 28, ll. 11-15.) Similarly, the required torque (T_d) of the axle is read from a map based on accelerator pedal position or throttle opening. (Col. 28, ll. 6-11.) Therefore, even if the upper limit torque (T_{mmx}) is assumed to be the same as the second torque recited in claim 1 of the present application, the required torque (T_{mr}) is not the same as the "first torque" recited in claim 1, since "the first torque [is] a function of at least the measured current...." The required torque (T_{mr}) described in Nada is not a function of a measured current, but rather, is based on engine torque and axle torque. Therefore, claim 1 of the present application recites elements which are neither expressly nor inherently described in Nada.

In addition to the foregoing, claim 1 of the present application also recites that the first and second torques are compared "when the motor speed is above a predetermined speed." Again, no such element is expressly or inherently described in Nada. Therefore, with regard to the Nada reference and claim 1 of the present application, the MPEP definition of anticipation is not met.

A similar analysis can be used for claims 10 and 18 of the present application. For example, claim 10 recites a method for monitoring torque in an electric motor that includes "determining a first torque based on measured current... and comparing the first torque to the second torque when the motor speed is above a predetermined speed." Claim 18 recites a

system for monitoring torque in an electric motor, where the system includes a first controller configured to determine first and second torques "and to compare the first torque to the second torque when the motor speed is above a predetermined speed," where "the first torque [is] a function of at least the motor current...." Therefore, claims 10 and 18 each contain elements which are neither expressly nor inherently described in Nada, and with regard to these claims, the MPEP definition of anticipation is not met.

Claim 1 is the base claim for claims 2-3, 6 and 8-9. Claim 10 is the base claim for claims 11 and 15-17. Claim 18 is the base claim for claims 22-23. Each of these dependent claims contains all of the limitations of its respective base claim, as well as additional limitations which further distinguish it from the cited reference. For example, claim 2 recites "calculating a difference between the first and second torques, and comparing the difference to a first predetermined torque." As noted above, Nada does not describe first and second torques as recited in claim 1; in addition, the comparison of the required torque (T_{mr}) and the upper limit torque (T_{mmx}) described in Nada is different from the comparison of the torques as recited in claim 2 of the present application. For example, the torques determined in Nada are not subtracted from each other, but rather, are compared to each other merely by determining which of the two is larger. (Col. 28, ll. 29-30.) Depending on the outcome of the comparison, one of the torques is used as the target torque (T_m) of the motor. This is distinctly different from the method recited in claim 2, which calculates a difference between the two determined torques, and compares this difference to a predetermined torque. Thus, each of the dependent claims contains limitations which are neither expressly nor inherently described in Nada. Therefore, with regard to Nada and claims 2-3, 6, 8-9, 11, 15-17 and 22-23, the MPEP definition of anticipation is not met.

Claim Rejections—35 U.S.C. § 103

The Examiner rejected claims 7 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Nada in view of U.S. Patent No. 6,646,394 (Minagawa et al.). The Examiner also rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Nada

in view of U.S. Patent Application Publication No. 2003/0102181 (Tokumoto). The MPEP states that in order to establish *prima facie* obviousness, all of the claim limitations of an invention must be taught or suggested by the prior art. MPEP § 2143.03, 8th ed., Rev. 2. Because none of the cited references, alone or in combination, teaches or suggests all of the claim limitations of claims 7, 12 or 21, it is submitted that none of these claims is obvious in light of the cited references.

As noted above, independent claims 1, 10 and 18 each contain elements which are neither expressly nor inherently described in Nada. Moreover, Nada fails to teach or suggest all of the limitations of claims 1, 10 and 18. Even when Nada is combined with Minagawa et al. or Tokumoto, each of the independent claims contains limitations which are neither taught nor suggested by the references. Claims 1, 10 and 18 are the respective base claims for claims 7, 12 and 21. Each of these dependent claims contains all of the limitations of its respective base claim, as well as additional limitations which further distinguish it from the cited references. Therefore, with regard to claims 7, 12 and 21, the MPEP requirements for *prima facie* obviousness are not met.

Claim Objections

The Examiner has objected to claims 4, 5, 13, 14 and 19. Based on the foregoing, it is believed that the respective base claims for each of these dependent claims is allowable. Accordingly, Applicants submit that each of the objected to claims are also allowable.

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Based on the foregoing, allowance of each of the pending claims is requested.

Respectfully submitted,

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